Tissue Doppler, Speckle Tracking and Strain Imaging

# Left ventricle longitudinal strain alterations in asymptomatic or mildly symptomatic pediatric patients with recent SARS-CoV-2 infection

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**Background:** Evidence suggests that clinical manifestations of children's COVID-19 may be less severe. However, it has been described the pediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 (PIMS-TS) which resembles other inflammatory conditions (i.e. Kawasaki disease). Patients affected by PIMS-TS showed cardiac involvement with myocardial injury, reduced left ventricle systolic function and coronary artery abnormalities. Little is known regarding cardiac involvement in pediatric patients with asymptomatic or mildly symptomatic SARS-CoV-2 infection.

**Methods:** We analyzed 23 pediatric patients (13males, 56%) with diagnosis of SARS-CoV-2 infection based on PCR analysis of nasopharingeal swab (NPS), and asymptomatic or only mildly symptomatic for COVID-19. Patients underwent standard transthoracic echocardiogram (TTE) within 2-3 month from diagnosis and after negative NPS for SARS-CoV-2. We performed offline analysis with GE EchoPAC software to measure global longitudinal strain (GLS) of the LV using 2D speckle tracking imaging. Therefore, we compared the results with a matched group of 23 controls (13males, 56%).

**Results:** Cases and controls were similar regarding age (5.9 ± 4.1years vs. 6.4 ± 4.4 years, p = 0.63), body surface area (0.98 ± 0.3m2 vs. 0.8 ± 0.4m2, p = 0.17), LV FS (37.9 ± 5.9% vs. 36.4 ± 8.3%, p = 0.74) and LV biplane EF (63.9 ± 5.2% vs. 66.4 ± 5.3%, p = 0.11). GLS analysis showed significant strain reduction of the LV mid-wall segments and of the basal anterior, posterior and septal inferior segments among cases compared to controls. Furthermore, in the case group there were 7 subjects (30%) with a strain below 16.5% in at least 3 segments.

**Conclusion:** SARS-CoV-2 infection may affect LV deformation in asymptomatic or only mildly symptomatic children, showing a peculiar pattern with lower longitudinal strain in all mid-wall segments of LV compared to control subjects. The clinical significance of this findings is unclear and follow-up is needed to verify the reversibility of this alterations.